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## Technical Report No. 3

# SUMMARY BASELINE FOR AMMA-2050



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Photos on front cover from T. Warnars

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## **Publishable Summary**

The report forms a summary baseline for AMMA-2050, supporting the monitoring of impacts over the course of the four-year project. The contents are structured around the FCFA programme logframe, outlining baselines for the project in terms of impacts, outcomes and outputs. Data to inform the baseline are drawn from a range of sources including: a summary of current scientific knowledge about future climate in West Africa; a range of project activities, including stakeholder engagement meetings and a series of key informant interviews; an analysis commissioned by CCKE; and a number of complementary initiatives.

## **Acronyms**

AgMIP	Agricultural Model Intercomparison and Improvement Project
AMMA-2050	African Monsoon Multidisciplinary Analysis-2050
ANACIM	Agence Nationale de l'Aviation Civile et de la Météorologie – National Agency of Civil Aviation and Meteorology, Senegal
ANCAR	Agence Nationale de Conseil Agricole et Rural - National Agricultural and Rural Advice Agency, Senegal
ASPRODEB	Association Sénégalaise pour la Promotion du Développement par la Base
BRACED	Building Resilience to Climate Extremes and Disasters, DFID-funded programme
CCAFS	Climate change, agriculture and food security research programme/
CCASA	Changement climatiques, l'agriculture et la sécurité alimentaire
CNAAS	Compagnie Nationale d'Assurance Agricole du Sénégal - the National Agricultural Insurance Company of Senegal
CCCo	Cadre de Concertation Communale - Commune Consultative Group, Burkina Faso
CCKE	Coordination Capacity Building and Knowledge Exchange Unit of the NERC-DFID FCFA programme
CODESUR	Conseil Départemental pour les Secours d'Urgence et Relèvement - Departmental Council for Emergency Relief and Rehabilitation, Burkina Faso
COMNACC	Comité Nationale du Changement Climatique - National Committee on Climate Change, Senegal
COMRECC	Comité Régionale du Changement Climatique – Regional Committee on Climate Change, Senegal
CONASUR	Conseil National de Secours d'Urgence et de Rehabilitation – National council for Emergency Assistance and Rehabilitation, Burkina Faso
CONEDD	Conseil national de l'environnement et du développement durable- National Council for the Environment and Sustainable Development, Burkina Faso
CNCR	Conseil National de Secours d'Urgence et de Rehabilitation, Senegal
CPDN	Contributions Prévues Déterminées au Niveau national/ INDC Intended Nationally Determined Contributions
DEEC	Direction de l'Environnement et des Etablissements Classés- Department of the Environment and classified enterprises, Senegal
DFID	UK Government Department for International Development
DGM	Direction Générale de Météorologie - National Department of Meteorology, Bukina Faso

DGRE	Direction Générale des Ressources en Eau – Water Resources Department, Burkina Faso
DREEC	Division Régionale de l’Environnement et des Etablissements Classés – Regional Department for the Environment and Classified enterprises, Senegal
ENDA	Environment and Development Action in the Third World, Senegal
FCFA	Future Climate for Africa programme
FONGS	Fédération des Organisations Non-Gouvernementales du Sénégal
HIW	High Impact Weather
ISRA	Institut Sénégalais de Recherches Agricoles – Senegalese Institute of Agricultural Research
KII	Key Informant Interviews
MUH	Ministere de l’Urbanisme et de l’Habitat – Ministry of Urbanism and Housing, Burkina Faso
NAPA	National Adaptation Plan of Action
PRISE	Pathways to Resilience in Semi-arid Economies/PRESA Promouvoir la Résilience des Economies en zones Semi-Arides, project of DFID-funded CARIAA programme
PWG	Pluri-disciplinary working group/ GTP Groupe de Travail Pluridisciplinaire d’Assistance agro-météorologique, Senegal
ROPPA	Reseau des organisations paysannes et des producteurs agricoles de l’afrique de l’ouest- West African network of peasant farmer organisations
SDAGO	Schéma directeur d’aménagement du Grand Ouaga – Horizon 2025, the Grand Ouaga Plan
SREC	Regional pluri-disciplinary platform for Sociétés Rurales a l’Environnement et au Climat en Afrique de l’Ouest
WECARD	Western and Central African Council for Agricultural Research and Development/ CORAF, Conseil Ouest et Centre Africain pour la Recherche et le Developpement Agricoles

## **1.0 Purpose of the summary project baseline**

The aim of this summary baseline for AMMA-2050 is to consolidate findings from across WPs to develop an agreed baseline from which to measure the impact of AMMA-2050 activities. The content of this report is structured around the FCFA logframe, and for which the AMMA-2050 project has agreed specific contributions.

The baseline may support identification of relevant opportunities and approaches for AMMA-2050 climate products to inform decision making, but this remains reliant on more detailed political-economy analyses of each of the specific decision making contexts which the pilots are seeking to inform.

## **2.0 Materials and data for the baseline**

The baseline has employed findings and products developed principally through AMMA-2050 activities and partners, as well as materials from a number of complementary projects, including:

1. A set of slides developed by WP1-2 assessing the current state of knowledge about future climate in West Africa, together with a report on the HIW metrics to be developed by AMMA-2050.
2. Stakeholder engagements including: reports of the stakeholder meetings held in Senegal and Burkina Faso, an exercise mapping safety and certainty undertaken within each stakeholder meeting, and a set of Key Informant Interviews (KIIs) undertaken with decision makers who are key stakeholders in the pilot studies being undertaken in Senegal and Burkina Faso, as well as scientists in Senegal, Burkina Faso, France and the UK partnering in the project.
3. A desk-based analysis of Senegal undertaken for AMMA-2050 by Pegasys, commissioned by the UK Department for International Development (DFID) Future Climate for Africa (FCFA) programme's Coordination Capacity Building and Knowledge Exchange (CCKE) Unit.
4. A series of recent reports undertaken by the Climate Change, Agriculture and Food Security (CCAFS) research programme, the DFID-funded Pathways to Resilience in Semi-arid Economies (PRISE) and other complementary initiatives.

AMMA-2050 developed a scorecard designed to establish a baseline and monitor key areas of change, over the course of the project, with sets of questions designed for both decision makers and scientists or climate information providers. Key areas of change being monitored through the scorecards include: decision makers' awareness of climate risks, product relevance, stakeholder engagement, planning under uncertainty, institutional capacity to use and communicate climate information, and regular channels for dialogue between decision makers and climate information providers.

Scorecards have been undertaken with twenty-four decision makers in Burkina Faso and Senegal and twenty-one scientists across Burkina Faso, Senegal, France and the UK. All the KIIs were asked to consider their responses in terms of the organisation, team or group with which they work, rather than on an individual basis. Scientists were asked to consider decision makers separately at national and sub-state levels. In answering questions, respondents were given four options: not at all

(0), somewhat (1), partially (2) and completely (3). A separate technical report on initial KII findings is available ([www.amma2050.org/content/technical-reports](http://www.amma2050.org/content/technical-reports)).

A series of more detailed baseline interviews, planned for both Burkina Faso and Senegal, has not yet taken place. Likewise awaited are political-economy analyses of the formal and informal decision making processes within the two decision making contexts (Senegal and Burkina Faso) which the project seeks to inform.

### 3.0 AMMA-2050 Baseline for Impacts, Outcomes and Outputs

#### IMPACTS and OUTCOMES

Indicator(s)	FCFA Baseline	AMMA-2050 Baseline
Number of long-term policies, plans and investments informed by enhanced knowledge of climate science for Africa	<i>Low level of recognition of long-term climate risk in decision making processes.</i>	Decision makers are not accounting for climate risks in medium-term plans, policies and investments leading to reduced long-term resilience. West Africa experiences extreme rainfall variability including drought and flooding. There is limited information on how rainfall and High Impact Weather (HIW) in the region may change. The information which is available is often not accessible or relevant for decision makers. There is low awareness of climate risks and limited capacity and support to manage such risks within medium term decision making (AMMA-2050 Theory of Change, November 2015)
<i>Number of infrastructure plans/building strategies, which incorporate climate information and/or revised technical specifications to take into account future climate stressors and/or conditions</i>	<i>High growth in African economies will lead to large infrastructure investments which are currently made with little, poor or no climate information.</i>	
<i>Level of support for medium term (5-40yr) decisions provided by new body of high-quality, robust climate information, products and tools (Footnote: this pertains to policy, planning, investment and/or research decisions)</i>	<i>Little information available to aid interpretation of AR4/5 outputs.</i>	
<i>Level of user-awareness of the relevance of long-term climate change to decision making</i>	<i>Generally low awareness of relevance of long-term climate to decisions today and low use of climate information.</i>	In KIIs, most interviewed decision makers in Senegal and Burkina Faso recognised that their decisions are completely or partially sensitive to climate change. This contradicts the assumption that baseline awareness of climate risks is low.
<i>Knowledge of climate change is institutionally embedded</i>		In the decision making context of focus for the two AMMA-2050 pilots, climate change issues are addressed in a very limited way due to a range of institutional constraints including: institutional instability, rapid turn-over of staff, lack of budgeting and clear assignment of responsibilities for adaptation (see further Output 2). In KIIs, almost two thirds of decision makers interviewed considered that their organisation had complete or partial capacities to use climate information within medium-term decision making, while more than a third assessed that their organisation had limited capacity.

In both Burkina Faso and Senegal, there appear to be five principal areas for project focus:

1. Co-producing relevant High Impact Weather (HIW) climate information to support (a) specific decision making processes within the 2025 Grand Ouaga plan and (b) research on developing climate-resilient crops for Senegal and the wider West African region;
2. Strengthening scientists' engagement with decision makers and developing approaches which support the co-production of decision-relevant climate information;
3. Engaging with the development of national climate services plans;
4. Strengthening links between operational meteorological services and climate research;
5. Strengthening the operational capacities of national meteorological services.

The majority of decision makers interviewed for the project pilots recognised that their decisions are 'completely' or 'partially' sensitive to climate change. This contrasts with the assumption of DFID Future Climate for Africa (FCFA) programme logframe Outcome Indicator 2, which assumes 'Generally low awareness of the relevance of long-term climate to decisions today' and the AMMA-2050 Theory of Change problem statement which noted 'low awareness of climate risks' amongst decision makers. However interviewed partnering scientists assessed decision makers' consideration of climate change impacts as lower, with the majority of national and regional decision makers' consideration being 'somewhat' or 'partial', and the majority of local decision makers' consideration as 'somewhat' or 'not at all'.

As most of the decision makers interviewed in Senegal have responsibilities directly relating to climate change, it is questionable how representative their responses are both of the organisations which they represent as well as of other government agencies. Indeed a number of key informants highlighted that climate is considered by many policy makers to be an 'environmental' issue, rather than being integrated within decision making across sectors and ministries. KIIs and reference reports in both Senegal and Burkina Faso have identified significant differences in capacities to use climate information at different levels of decision making, with greater capacities at national and regional as opposed to sub-regional levels<sup>1</sup>.

**OUTPUT 1: Enhanced scientific knowledge and prediction of African climate and new understanding of the resulting impact on the robustness of future climate scenarios**

Indicator(s)	AMMA-2050 Baseline
Cumulative number of peer reviewed articles, working papers and policy briefs published on issues of climate science and its application in Africa	0
<i>Understanding, modelling and projections of HIW events in West Africa</i>	Little available knowledge of the integration of HIW in climate models.

<sup>1</sup> Dia (2016), Wetta (2015).



AMMA-2050 WP1 and 2 developed a series of slides summarising the current understanding of historical trends and future climate in West Africa<sup>2</sup>. Key understandings include that:

- In the last 60 years the Sahel has warmed by approximately 1°C. This trend is highly likely to continue into the future with rises in temperature of 1.5 to 4°C by the mid-century.
- The number of heatwaves (at least 3 days with daily maximum temperature greater than 41°C) are likely to substantially increase by mid-century, especially in the western Sahel.
- There is much uncertainty about future changes in rainfall with current patterns of high variability from year to year and decade to decade likely to continue.
- Most current climate models predict a drying in the Western Sahel, and a wetting in the central and East Sahel. However some equally credible models, do not predict this pattern.
- Generally in the Sahel, rainfall is projected to become less frequent, but when it rains, it will likely be more intense.
- Despite large uncertainties in future temperature and precipitation changes, sorghum and millet yields are projected to go down under any plausible combination of change in these.

Burkina Faso's NAPA plans are based on a 0.8°C rise in average temperatures by 2025 and an 1.7°C rise by 2050, with declines in rainfall of -3.4% by 2025 and -7.3% by 2050<sup>3</sup>. According to the 2<sup>nd</sup> Report on the State of the Environment (REEB2)<sup>4</sup>, a declining trend in rainfall has been recorded in recent decades in all of the country's climatic zones. In their presentation to the AMMA-2050 Stakeholder meeting in Ouagadougou, the Direction Générale de la Météorologie (DGM) reported that observational records for Ouagadougou indicate: an increase in heavy rainfall, decreases in extreme minimum temperatures, increases in extreme maximum temperatures and the number of days over 40 degrees, and a reduction in number of days with cooler temperatures<sup>5</sup>.

Senegal's recent climate has experienced strong spatial and temporal variability, while temperatures have increased by 0.9°C since 1975<sup>6</sup>. More recently, there is evidence of extreme events across the region that exceed natural climate variability. This includes an average increase in land surface temperatures by 0.5°C or more during the last 50–100 years and a significant increase in the temperature of hottest days and coolest days observed in some areas (IPCC 2013)<sup>7</sup>. The intensity of rainfall events has strongly increased, while the north of Senegal has become increasingly arid. The 400mm isohyt has moved south by almost 100km and the 800mm isohyt has also moved south, impacting the peanut basin area<sup>8</sup>.

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<sup>2</sup> Hartley et al (2016).

<sup>3</sup> Christian Aid (2015) BRACED Baseline Burkina Faso

<sup>4</sup> 2<sup>nd</sup> Report on the State of the Environment in Burkina Faso, SP-CONEDD, 2009, as reported in Christian Aid (2015), p15.

<sup>5</sup> Wongo, M, DGM, presentation to AMMA-2050 8 July Stakeholders meeting.

<sup>6</sup> Gaye (2015), p40-46.

<sup>7</sup> Kane (working draft).

<sup>8</sup> Gaye (2015), p40-46.

**OUTPUT 2: Suite of co-produced pilot studies, demonstrating the application, value and role of climate information in complex decision making contexts relevant to support long-term (5-40yr) investments, policies and plans**

Indicator(s)	AMMA-2050 baseline
Number of case studies across a) a range of decision types, b) sectors and c) countries	The project focuses on undertaking pilots where the project's enhanced understanding of future HIW can support i) flood prevention within the 2025 Grand Ouaga plan and ii) research to develop sorghum and millet seed more resilient to future climate changes, and so contribute to the Plan Senegal Emergent (PSE) (Plan for an Emerging Senegal). These pilots enable consideration of how enhanced HIW climate information can support urban and rural planning across 2 countries in West Africa.
<i>Number of institutions directly engaged and contributing to co-production of the pilot studies and number of countries.</i>	In the project kick off-meeting in October 2015, partners identified a wide range of stakeholders to engage in pilot studies. Potential key stakeholders in Senegal were identified as including: Agence Nationale de l'Aviation Civile et de la Météorologie (ANACIM), Institut Sénégalais de Recherches Agricoles (ISRA), Comité Nationale du Changement Climatique (COMNACC), Association Sénégalaise pour la Promotion du Développement par la Base (ASPRODEB), l'Association des Unions Maraîchères des Niayes (AUMN), Fédération des Organisations Non-Gouvernementales du Sénégal (FONGS), Agence Nationale de Conseil Agricole et Rural (ANCAR) and L'Institut de Technologie Alimentaire (ITA), while key stakeholders identified in Burkina Faso included: the Volta Basin Authority (VBA), Direction Générale de l'Urbanisme et des Travaux Fonciers (DGUTF), Ministère de l'Urbanisme et de l'Habitat (MUH), Commission régionale de l'urbanisme et de la construction du centre (CRUCC), DGM, Direction Générale des Ressources en Eau (DGRE), the Democratic Governance Thematic Trust Fund (DGTTF), Direction Générale des Services Techniques Municipaux (DGSTM), Direction de la Planification (DPU), La Direction générale de la protection civile (DGPC), Conseil national de l'environnement et du développement durable (CONEDD), Conseil National de Secours d'Urgence et de Rehabilitation (CONASUR), the Municipality of Ouagadougou, the Burkina Faso Red Cross, Fonds national de Solidarité (FNS), Direction Générale des Ouvrages d'Art (DGOA) and Direction générale de l'assainissement (DGA). Representatives of many of these organisations participated in the 2016 stakeholder meetings, were amongst the Key Informants interviewed and/or were engaged through individual meetings. These and/or other organisations will be engaged over the course of the project as understanding of the stakeholder landscape further develops.
<i>Perception of key users (institutions) of the utility of their engagement (in terms of understanding of climate risks and opportunities and applicability of co-produced knowledge products)</i>	<p>Stakeholder consultation was undertaken during proposal development, including through the 2014 Dakar meeting, to ensure that the focus of the pilots and overall project were appropriate to supporting decision makers with specific medium-term decisions. Initial meetings in 2016 for both pilots have made clear that stakeholders are keen to engage with AMMA-2050.</p> <p>The AMMA-2050 stakeholder meeting in Senegal, KIIs and the CCAFS report recognise that local knowledge is not sufficiently valued and that information needs to be provided in local languages. Ongoing research and participants in the Senegal stakeholders' meeting recognise there are insufficient varieties of seed adapted for different conditions. Meeting participants agreed on the need for:</p> <ul style="list-style-type: none"> <li>• Strengthening stakeholder capacities to better integrate climate change information within their decision making</li> <li>• Establishing a consolidated federal programme on climate change</li> <li>• Integrating agroecology within agricultural policies</li> <li>• Improving access to climate information through a range of media channels to support improved agricultural planning</li> <li>• Integrating climate information within rural infrastructural development</li> <li>• Establishing a framework for sharing meteorological and climate data</li> </ul> <p>Key stakeholders recognise that the 2025 Grand Ouaga plan developed in 2008 has limited address of flood risk. A number of ministries, including the MUH, CONASUR and the DGRE, base their work on current understanding of flooding rather than employing scientific understandings of future climate risks. The initial Stakeholders meeting highlighted opportunities for strengthening scientists' engagement with the MUH, in the area of urban planning, and within CONASUR, in the area of prevention. Earlier stakeholder consultation identified specific capacity building requirements, including within the Ministry of Water, Hydrologic Planning and Sanitation on flood monitoring (Early Warning System) and hydrological data and within DGM on extreme weather events and hydrographic processing tools.</p>

## Senegal

In Senegal, frameworks for enabling climate information to support decision making are well-developed at the national level and within a number of provinces. The Ministry of Environment has a division working on climate change, the Direction de l'Environnement et des Etablissements Classés (DEEC), with each region led by a Division Régionale de l'Environnement et des Etablissements Classés (DREEC). The Comité National sur les Changements Climatiques (COMNACC) and Comités Régionaux de Changements Climatiques (COMRECC) bring together key stakeholders at the national and regional levels, while Changement climatiques, l'agriculture et la sécurité alimentaire (CCASA/CCAFA) supports a platform bringing together policy makers and researchers on climate-related agricultural and food security decision making, supporting training and awareness raising at national level and within a number of regions. Its role is mostly at policy level. There is also the Pluri-disciplinary Working Group (PWG)/Groupe de Travail Pluridisciplinaire d'Assistance agro-météorologique (GTP), which brings together representatives from the Departments of Agriculture, Livestock, Water and Forests, Institut Sénégalais de Recherches Agricoles (ISRA), Centre du Suivi Ecologique (CSE), Agence Nationale de Conseil Agricole et Rural (ANCAR), Compagnie Nationale d'Assurance Agricole du Sénégal (CNAAS) - the National Agricultural Insurance Company of Senegal, Agence Nationale de l'Aviation Civile et de la Météorologie (ANACIM), community radio/Radio Rurale and seed producers at national level and within four regions, with local government. The PWG organises meetings in advance of the principal rainy season and then every ten days over the course of the rains to interpret the forecasts in the context of each sector and provide relevant advice to farmers. This is focused on supporting the use of seasonal and sub-seasonal information, rather than longer-term climate information. A WP5 commissioned draft report maps some of the key stakeholders and coordination mechanisms in climate-related decision making in Senegal, see Figure 1.

While promotion of climate information has been specifically recognised as an adaptation measure within the Contributions Prévues Déterminées au Niveau national (CPDN)/Intended Nationally Determined Contributions (INDC), a recent CCAFA report notes barriers to enabling effective integration of climate change within agricultural and food security policies. The report highlights the lack of a framework for coordinating between ministries, agencies, programmes and projects; lack of technical capacities and financial constraints in accessing and using climate and hydrometeorological information, agricultural technologies and adaptation practises within development and adaptation projects; and the importance of strengthening climate-related indicators within monitoring and evaluation<sup>9</sup>. Moreover, there have been frequent institutional changes within the Agriculture Sector resulting in fluctuations in approach and priorities and internal coordination difficulties. Climate change has not been sufficiently integrated within key agricultural policies and programmes or, where included, the responsibilities, measures and budgets for implementation are not clear<sup>10</sup>. Senegal's National Economic and Social Development Strategy (Strategie Nationale de Développement Economique et Sociale) 2013-2017 has been criticised 'for (i) its lack of addressing specific technical and institutional barriers that undermine farmers' adaptive capacity, (ii) its lack of a 'systematic assessment of how climate change could undermine the objectives

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<sup>9</sup> Dia (2016)

<sup>10</sup> P20-24, Dia (2016).

targeted in this strategy', and (iii) its lack of ability to calculate what the additional costs of adaptation would imply in the different sectors'.<sup>11</sup>

The CCAFS report also highlighted the need to build awareness of climate change in rural areas, strengthen access to climate services, integrate climate change in decentralisation development policies and create strategies to enable communities to develop proposals appropriate for their local climates. It also raised the importance of supporting ministries in integrating climate change in decision making and building climate change capacities within the National Assembly and local government<sup>12</sup>. A report commissioned by AMMA-2050's WP5 identified the importance of working through the Parliamentary Network for Environment<sup>13</sup>. In interviews for AMMA-2050, many key informants noted that existing frameworks have limited reach to local decision makers. COMRECC does not have sufficient funding to be a permanent structure and draws in technical assistance required from elsewhere to a specific region. The UNDP Territorial Approach to Climate Change (TACC) seeks to strengthen regional capacities to integrate climate change in local decision making.<sup>14</sup>

Engagements between decision makers and research institutions appear to operate principally between key individuals within key coordinating structures, with limited onward sharing of information within respective organisations. Channels for engagement between meteorological services and climate-related research do not seem to be well developed, an area which the emerging national framework for climate services is seeking to address.

Farmers' organisations and civil society networks, including the Fédération des Organisations Non-Gouvernementales du Sénégal (FONGS – Federation of Non-governmental organisations of Senegal) and the Réseau des Organisations Paysannes et des Producteurs Agricoles de l'Afrique de l'Ouest (ROPPA - Network of Peasant Organisations and Producers in West Africa), hold considerable power and can advocate for the adoption of resilient strategies and climate change awareness. Women have unequal access to property and water resources, limited participation in decision making and natural resource management, high levels of illiteracy and difficulties in accessing credit and agricultural practices and technologies for adaptation. Some agricultural policies, such as Programme d'Accélération de la Cadence de l'Agriculture Sénégalaise (PRACAS), integrate measures to support gender equality.<sup>15</sup>

AMMA-2050 interviews and the CCAFS report recognise that local knowledge is not sufficiently valued and that information needs to be provided in local languages<sup>16</sup>. There are difficulties in accessing appropriate land including issues of land ownership, soil degradation and salinization. There are insufficient varieties of seed adapted for different conditions. The process of breeding, production and adoption of new crop varieties can take up to thirty years and currently is not keeping pace with

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<sup>11</sup> Pegasys (2015) referencing Lo and Tumusiime (2013), p24.

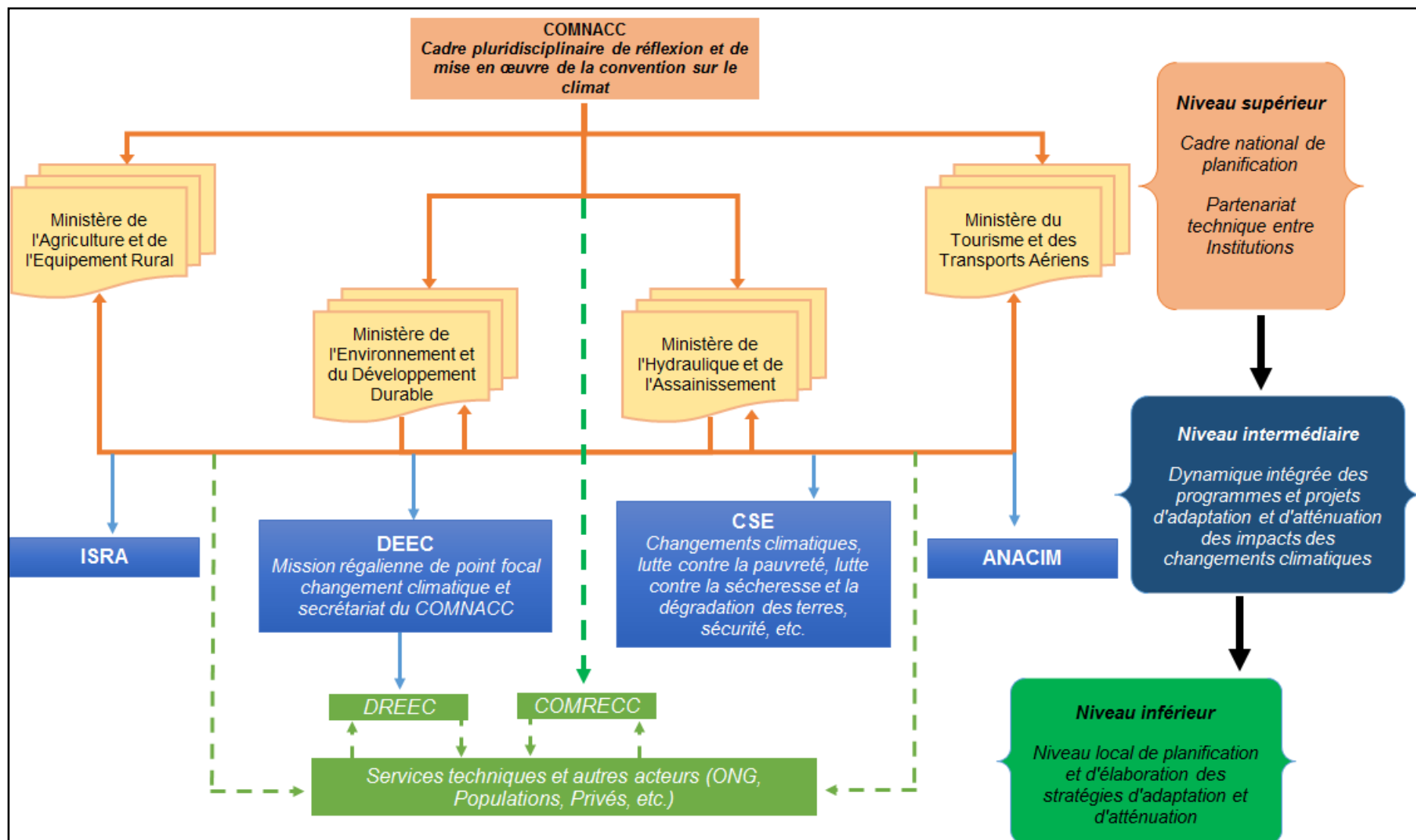
<sup>12</sup> P15 and 32, Dia (2016).

<sup>13</sup> Fall (2016) p30.

<sup>14</sup> Gaye et al (2015) PRISE, p31

<sup>15</sup> Dia (2016), p29.

<sup>16</sup> Dia (2016), p33.



**Figure 1: Schéma conceptuel du cadre institutionnel et interactions entre institutions intervenant dans le domaine des changements climatiques,** (Conceptual diagram of the institutional framework and interactions between institutions involved in the area of climate change) (Fall, M 2016) p29.

changes in climate<sup>17</sup>. Partners are already engaged with the Western and Central African Council for Agricultural Research and Development (WECARD/CORAF) and the Agricultural Model Intercomparison and Improvement Project (AgMIP).

Participants at the AMMA-2050 stakeholder meeting recognised the possibility of creating an early warning system within an emergency adaptation programme, as well as:

- Strengthening stakeholder capacities to better integrate climate change information
- Establishing a consolidated federal programme on climate change
- Integrating agroecology within agricultural policies
- Improving access to climate information through a range of media channels to support improved agricultural planning
- Integrating climate information within rural infrastructural development
- Establishing a framework for sharing meteorological and climate data<sup>18</sup>.

### **Ouagadougou**

In Burkina Faso, the Ministry of Environment and Sustainable Development (MEDD) ensures overall coordination of environmental issues, while the Ministry of Social Action and National Solidarity (MASSN) manages issues related to risk and natural disasters. The Conseil National de Secours d'Urgence et de Rehabilitation (CONASUR, National Council for Emergency Relief and Rehabilitation) is responsible for disaster prevention, emergency response and rehabilitation, and coordinates disaster response through councils for emergency relief and rehabilitation at regional (CORESUR), provincial (COPROSUR), departmental (CODESUR) and village (COVISUR) levels. The National Council for the Environment and Sustainable Development (CONEDD) likewise supports decentralised engagement on development through the Consultation Frameworks at the regional (CCR), provincial (CCP) and commune or municipal (CCCo) levels. A number of government actions, including new construction methods, a review of the national housing and urban development plan and housing code, are considered to have reduced the vulnerability of urban infrastructure to climate extremes.<sup>19</sup>

In relation to integration of climate information within medium-term decision making, stakeholders mentioned extensive turnover of staff and changing government structures, together with a lack of operationalisation and enforcement of policies and legislation developed. There is a lack of effective coordination resulting in contradictory policies and strategies between sectors as well as between the public and private sectors, with environmental issues insufficiently considered within decision making<sup>20</sup>. While the interim Government ratified the National Strategy for Prevention and Management of Risks and Disasters in 2014, it lacks a clear budget allocation and is unclear on allocation of responsibilities. There is low knowledge of the law, particularly amongst local officials who change regularly and have competing

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<sup>17</sup> Challinor (2016).

<sup>18</sup> Sall (2016).

<sup>19</sup> Wette (2015), p56.

<sup>20</sup> SDAGO, p163.

priorities<sup>21</sup>. Lack of community participation in adaptation planning, institutional instability, insufficient national funding and reliance on external funding, as well as lack of monitoring of the NAPAs, are amongst the recognised constraints to effective adaptation<sup>22</sup>.

The city of Ouagadougou has experienced significant demographic changes in the recent past. In the period from 1985-2000 the population of Ouagadougou doubled from 436,000 to 980,000 inhabitants, putting severe pressure on services<sup>23</sup>. This number has continued to grow. In 2006 the city's population was estimated at 1.5 million<sup>24</sup>, reaching 1.915 million in 2012. Population projections estimate the number will reach 2.4-2.5 million inhabitants by 2025 with ongoing growth. There are significant concerns that lack of effective urban planning will result in increased vulnerabilities within unregulated areas of settlement<sup>25</sup>. The proportion of the urban population living below the poverty line grew from 10.4% in 1994 to 16.5% in 1998. While there are higher number of men in the city, with migration from the countryside, the population of Ouagadougou is becoming increasingly female and young<sup>26</sup>. Education and literacy levels are higher in Ouagadougou than nationally. In 2003, 97% male and 92% women attended primary education, compared to the national average of 47% male and 38% female. While access to secondary education is lower, this is primarily focused in Ouagadougou. In 2006 only 19% of the city's population had sanitation in their homes. Management of industrial waste was recognised as insufficient, with canals filled with rubbish.<sup>27</sup> Stakeholders noted that 'there is not one Ouaga': there are the original central areas, the rural areas which have now been integrated within the expanding capital and the newly developed area<sup>28</sup>. Not only are structural settlement plans impacted by climate change, but there are also health and sanitation implications. Increased temperatures and dry spells have heightened risks of meningitis and respiratory illnesses, and there is a recognised need for forecasts to support health planning<sup>29</sup>. During floods, schools are often occupied by the displaced. During drought, families often take their children out of school to assist in activities to meet household needs. Bridges and roads have been severely affected in past floods.

Burkina Faso experienced 11 major floods between 1991-2009. Ouagadougou was heavily impacted by flooding in 2009<sup>30</sup>. Reasons for flooding in Ouagadougou include: the frequency of strong rainfall, non-respect of urban planning, impermeable soils (construction of roads and paving), inadequate or inexistent sanitation infrastructure, deforestation and silting of dams and rivers.<sup>31</sup> Annually incidents of natural hazards in Burkina Faso increased from 50 in 1975 to 200 in 2009<sup>32</sup>.

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<sup>21</sup> Christian Aid (2015), p19.

<sup>22</sup> Wette (2015), SDAGO (2008), Newhouse et al (2015).

<sup>23</sup> Newbourne et al (2015), p21.

<sup>24</sup> SDAGO, page 65-66.

<sup>25</sup> Newbourne et al (2015), p42.

<sup>26</sup> Wette (2015) p28-29.

<sup>27</sup> SDAGO, p106.

<sup>28</sup> Discussion during July 2016 Stakeholder meeting.

<sup>29</sup> Wette,(2015), p38.

<sup>30</sup> Presentations by 2iE referencing the joint Government of Burkina Faso, WHO, World Bank 2010 report on 'Inondations due 1 septembre 2009 au Burkina Faso, Evaluation des dommages, pertes et besoins de construction, de reconstruction et de relevement'.

<sup>31</sup> Diarra et al, 2iE presentation at July 2016 stakeholder meeting.

<sup>32</sup> Wette (2015), p34.



CONASUR maintains data on the number of people affected, injured and killed by flooding, as well as economic cost of the damage.

The original and revised Grand Ouaga plans did not fully integrate flood risks and appears to have included limited consultation with a number of key ministries and research institutions, with knowledge of the plan not widely shared. The MUH designated areas flooded in 2009 as building exclusion zones, which included areas around dams, along canals and in areas prone to recent flooding. However many have now been reoccupied and relocation has not been enforced.<sup>33</sup>

The original 1999 Grand Ouaga plan was not put in place, in part due to the proposed implementation structures not being established and conflicts over land ownership. Conflicts between customary law and decentralised governance in allocation of lands resulted in inter-generational conflict as well as disputes between indigenous and migrant populations. Resolution of conflicts over land were reportedly better where the mayor was delegated responsibility for moderating the issues. Where the role was assigned to a state-appointed 'commission d'attribution', people complained about the lack of transparency<sup>34</sup>.

The SDAGO Volume II maps flood risk but includes limited proposals for addressing this beyond proposing an area of eco-tourism and horticulture around the city's dams<sup>35</sup>. Volume II of the plan includes DGM historical information from 1987-2006 on average rainfall and temperatures, increases in temperatures and evaporation<sup>36</sup>. According to the plan, 3% of the Ouagadougou is floodable or holds seasonal waters<sup>37</sup>.

A number of ministries, including the MUH, CONASUR and the DGRE, base their work on current understanding of flooding (including the 2009 flood) and do not comprehensively integrate scientific understandings of future climate risks<sup>38</sup>. As in Senegal, a number of key informants raised the importance of strengthening engagements between decision makers and researchers, as promoted within the 2015 Sendai Framework for Disaster Risk Reduction. Discussions at the July 2016 Stakeholders meeting highlighted opportunities for strengthening scientists' engagement within MUH, in the area of urban planning, and with CONASUR, in the area of prevention<sup>39</sup>. Ministère de l'Eau, des Aménagements Hydrauliques et de l'Assainissement emphasised their need for capacity building in flood monitoring (Early Warning System) and hydrological data. The Government has initiated a 5-year integrated water resource planning since 2009<sup>40</sup>. DGRE have been trying to develop a data base on water resources, but currently information is only available up to 2011. DGM identified a need for capacity building on the topic of extreme weather events and hydrographic processing tools.

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<sup>33</sup> MUH presentation to Stakeholders meeting, July 2016.

<sup>34</sup> SDAGO, p175.

<sup>35</sup> MUH presentation to the AMMA-2050 Stakeholder meeting, July 2016.

<sup>36</sup> SDAGO, pages 49, 50, 51.

<sup>37</sup> SDAGO, p46.

<sup>38</sup> Key Informant Interviews, July 2016.

<sup>39</sup> 2iE, Report of the Stakeholders' meeting, July 2016.

<sup>40</sup> Interview with DGRE, July 2016.

Participants in the July 2016 Stakeholders meeting also identified relevant existing decision making bodies with which the AMMA-2050 pilots could readily engage, including the Conseil National d’Aménagement et d’Urbanisme and the recently developed Conseil National des Catastrophes<sup>41</sup>. The population of Ouagadougou was strongly affected by the 2009 flooding. Key stakeholders felt that when the project has developed relevant information, ‘there won’t be any difficulties in communicating it’<sup>42</sup>. The Global Framework for Climate Services (GFCS) Regional Coordinator, who supports the development of national frameworks for climate services in both Senegal and Burkina Faso, mentioned that previous efforts to address high turnover of government staff in related work in Niger incorporated placing externally-funded technical assistants in regional government structures. The technical assistants remained even if the political structures and representatives changed.<sup>43</sup>

**OUTPUT 3: Targeted, accessible, robust and innovative climate model outputs, information, services, decision-support tools, and communication products, tailored for application in real-world decision making.**

Indicator(s)	AMMA-2050 Baseline
Number of new climate information products and tools available to climate advisors including for open access	There is limited information on how rainfall and HIW in the region may change. The information which is available is often not accessible or relevant for decision makers. (AMMA-2050 (2015) Working draft Theory of Change). Opportunities for participatory planning within local decision making are limited. While there are a wide range of tools and approaches designed to support appropriate use of climate information within medium term decision making, few provide a framework for guiding the range of steps involved in the process of enabling co-production and use of climate information tailored to support specific decision making processes. Approaches seen as successful are proposed as best practice without sufficient assessment of their transferability and guidance on how to adapt to new contexts.
<i>Cumulative number of people reached in the product communication and outreach activities supported by the programme.</i>	0 AMMA-2050 has identified a number of organisations, networks and research programmes engaged in complementary initiatives within Senegal, Burkina Faso as well those operating at a regional level. Organisations within the two pilots are listed within AMMA-2050 Draft Stakeholder Engagement note, several of which are also included within Output 2 (above). Amongst those operating regionally, there is potential for effective engagement with: ROPPA, CORAD/WECARD, AgMIP, ECOWAS, CCAFS, PRISE, BRACED and the pluridisciplinary, regional platform Sociétés Rurales Environnement et Climate en Afrique de l’Ouest (SREC). Engagement includes participation and contribution to complementary ongoing activities, engaging expertise within the AMMA-2050 Stakeholder group and enabling wider reach of the project’s emerging learning.
<i>Perception of key users (institutions) of the utility of information, products and tools for supporting decision-making</i>	In KIIs, few decision makers felt they had sufficient tools and frameworks to support decision making under uncertainty, more than a third not having any at all. A number of decision makers and scientists welcomed opportunities to engage in developing these with AMMA-2050.

There exist a wide range of tools and approaches designed to support appropriate use of climate information within medium term decision making. Some of these may

<sup>41</sup> Working group feedback, July 2016 Stakeholder meeting.

<sup>42</sup> Key Informant Interviews, July 2016.

<sup>43</sup> Key Informant Interview, July 2016.

have limited integration of evolving scientific understanding of future climate risks, such as the CCAFS scenario project in West Africa. A number are designed to support specific elements of this process. For instance, a number of the Red Cross Red Crescent Climate Centre participatory scenario exercises are focused on enabling decision makers to appreciate the uncertainties within future climate scenarios and the implication of this for decision making processes. Few approaches provide a framework for guiding the range of steps involved in the process of enabling co-production and use of climate information tailored to support specific decision making processes. The adaptation pathways approach provides important learning on how this process may be supported<sup>44</sup>. A number of tools and approaches designed to support specific decision making processes have been identified as best practice without assessing their transferability to different decision making contexts.

In Burkina Faso, the DGM has a good national observational network and currently provides 24-hour forecasts, 7 day forecasts, 10-day agrometeorological bulletins, seasonal forecasts and early warning information through CONASUR. DGM also produce map climatologies of the rainy season, including average rainfall, onset and cessation, length of season and evapotranspiration indices. DGM forecasts are available on demand and emailed to a mailing list by the Director General to government departments and other stakeholders. There is no mandate for a public weather service and it has no overnight or weekend service, but DGM undertakes ‘roving seminars’ and engage in a range of climate services-related initiatives.<sup>45</sup>

**Box 1: Weather and climate information produced by the DGM, Burkina Faso<sup>46</sup>**

Parameters observed and measured by the DGM Burkina	Some products / weather and climate information provided by the DGM Burkina
<ul style="list-style-type: none"> <li>• <b>Relative humidity</b></li> <li>• <b>Piche evaporation data</b></li> <li>• <b>Evaporation tray data</b></li> <li>• <b>Rainfall</b></li> <li>• <b>Duration of sunshine</b> (<i>insolation</i>)</li> <li>• <b>Atmospheric pressure</b></li> <li>• <b>Global Radiation</b></li> <li>• <b>Vapour Pressure</b></li> <li>• <b>Wind</b> (<i>direction and speed</i>)</li> <li>• <b>Visibility</b> (<i>using markers</i>)</li> <li>• <b>Cloudiness</b> (<i>Type, Coverage and Height</i>)</li> <li>• <b>Past and Present weather</b> (<i>Fog, Mist damp, mist or dust dry mist, Lightning, Storm (Thunder), Rain Dew Halo</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Extremes</b> (<i>Heat waves, torrential rains, extreme drought, winds</i>)</li> <li>• <b>Roses winds</b></li> <li>• <b>Mapping and graphics products</b> (<i>dry spells, isohyets, migration isohyets, isotherms, start dates, end and length of the rainy season</i>);</li> <li>• <b>Products from the regional seasonal outlook forum PRÉvisions Saisonnières en Afrique de l'Ouest (PRESAO)</b> (<i>seasonal forecasting of rainfall</i>)</li> <li>• <b>Agrometeorological and Climatological Bulletins;</b></li> <li>• <b>Weather forecasts at different time-frames</b></li> <li>• <b>Various meteorological support</b></li> <li>• <b>Services</b></li> </ul>

*NB:* It should be noted that most of weather and climate information produced by the DGM is short-term.

While Agence pour la Sécurité de la Navigation Aérienne en Afrique et a Madagascar (ASECNA) used to provide weather forecasts on the radio, in 2014 there was

<sup>44</sup> Wise et al (2014).

<sup>45</sup> Bain and Henley (2014), p4.

<sup>46</sup> Traore et al (2016).

television but no radio broadcast of the weather forecast on the national broadcasting station, Radiodiffusion Television du Burkina (RTB), with air time having to be paid for<sup>47</sup>. KIIs highlighted that there is a need to identify ways for DGM to communicate directly with the public, and that the climate information which DGM currently produces is not clear for some decision makers, and does not always clearly communicate the levels of probability within the forecast.

In Senegal, ANACIM provides daily, 10-day and seasonal forecasts as well as weather warnings of flood and lightning. The seasonal forecasts include information on onset and false starts. ANACIM also provides a range of products specifically tailored for a range of sectors, including fishing. ANACIM support the PWG/GTP (as noted above), providing information communicated by Radio Rurale, through texts, bulletins and social networks. They also support the Cadre National pour les Services Climatiques (CNSC) which aims to support regular exchange between those sectors most affected by climate and the providers of climate information<sup>48</sup>.

Amongst the products which ANACIM delivers to support medium-term (5-40 year) decision making are climate change scenarios (mostly from CMIP5 runs). These are used to drive the impacts models of other institutions, including those focused on agriculture and water resources. The last CPDN/INDC as well as the Nationally Determined Contributions (NDC) scenarios data over Senegal were provided by ANACIM. ANACIM have, on specific requests, also provided data at longer time scales based on CORDEX and/or CMIP5.

Almost all of the decision makers interviewed in Senegal felt they are currently able to access climate information relevant to support medium-term decision making. This contrasts with Burkina Faso, where most decision makers felt they had limited access to relevant climate information. Interviewed partnering scientists felt that climate information is to some degree (majority 'partially' or 'somewhat') provided in a format relevant to national and regional decision makers while almost all felt that it is provided in a format which largely does not meet local decision makers' needs (majority 'not at all' or 'somewhat').

There are noticeable differences between decision makers' appreciation of the reliability of climate information (majority 'completely' and 'partially') and scientists' views on how reliable climate information is viewed by national decision (majority 'somewhat' and 'partially' reliable) and local decision makers (average 'somewhat' reliable).

Scientists accord greater importance than national decision makers as to how much uncertainties in climate information prevent national decision makers from using it. Scientists perceive that uncertainties in climate information are less of a constraint for local decision makers facing many other more immediate concerns.

There are considerable differences between Burkina Faso and Senegal concerning the existence of regular channels of dialogue between decision makers and climate information providers. Most interviewed decision makers in Senegal consider that

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<sup>47</sup> Christian Aid (2015) BRACED baseline report for Burkina Faso.

<sup>48</sup> ANACIM presentation to the AMMA-2050 April 2016 Stakeholders Meeting.

there are fairly good regular channels for dialogue between decision makers and climate scientists. In Burkina Faso, decision makers assessed current levels of dialogue to be much lower, with the majority assessing that such channels were non-existent.

AMMA-2050 has identified a number of organisations, networks and research programmes engaged in complementary initiatives within Senegal, Burkina Faso plus those operating at a regional level. Organisations within the two pilots are listed within AMMA-2050 Draft Stakeholder Engagement note. Engagement includes participation and contribution to complementary ongoing activities, engaging expertise within the AMMA-2050 Stakeholder group and enabling wider reach of the project's emerging learning.

Amongst those operating regionally, there are opportunities for engaging with ROPPA, CORAD/WECARD, AgMIP, ECOWAS, the Volta River Basin Authority, CCAFS, PRISE, BRACED and the pluridisciplinary, regional platform for Sociétés Rurales à l'Environnement et au Climat en Afrique de l'Ouest (SREC). ISRA has ongoing engagement with CORAD/WECARD, a number of AMMA-2050 partners are engaged with AgMIP, while there are clear opportunities to share AMMA-2050 outputs within fora focussed on ECOWAS' Regional Agricultural Policy (ECOWAP) and its associated Regional and National Agricultural Investment Plans (RAIP and NAIP), as well as through ROPPA.

AMMA-2050 complements the more socio-economic focus of CCAFS and PRISE. In Burkina Faso, 2iE have brought flooding and social science expertise to CCAFS' national scenario planning processes, and there may be similar opportunities to engage AMMA-2050 partners' expertise in CCAFS work in countries or regionally across West Africa. In Burkina Faso, AMMA-2050 brings climate science expertise and urban focus to complement the DFID-supported Building Resilience to Climate Extremes and Disaster (BRACED) projects which seeks to strengthen resilience of agro-pastoralists in three provinces. A number of initial discussions with PRISE highlighted that there are areas of shared interest, while the exact nature of collaboration has yet to be defined.

**OUTPUT 4: Increased knowledge, capacity and skills of African scientists and user groups to enhance the development and/or use of climate information**

Indicator(s)	AMMA-2050 Baseline
Number of African scientists directly and actively participating in FCFA research and capacity building activities. Disaggregate according to 1) core researchers contracted as members of RCs, other researchers involved in applied research fund or who are direct recipients of capacity development support, 2) Institution, 3) gender.	<p>0</p> <p>Partnering scientists have identified a need for strengthening West African scientists' expertise and tools for computing climate change metrics from CMIP data. Also important are facilitating West African scientists' access to scientific literature and data, and strengthening the capacities of young scientists in research skills, such as preparing papers for publication.</p> <p>A number of scientific partners working on West African climate have raised the need for creating a regular platform for exchange of emerging learning. Platforms have been initiated but lacked the resources to be maintained.</p>
Percentage / overall satisfaction level of targeted African scientists with the capacity building support; # and % of beneficiaries stating they are satisfied with the quality of the programme	<i>Awaiting template from CCKE to collate the views of African scientists engaging in capacity building support.</i>
Number of African boundary agents and users participating in capacity development activities. Disaggregate according to 1) core contracted RCs members, other boundary agents and users who are direct recipients of capacity development support, 2) Institution, 3) gender.	<p>In Senegal, there are considerable number of organisations and collaborative mechanisms actively supporting use of climate information within decision making, including COMNACC/COMRECC, CCASA/CCAFS, ASPRODEB and Environment and Development Action in the Third World (ENDA).</p> <p>In Burkina Faso, there are fewer established organisations actively engaged in this process. Those which have undertaken such initiatives include: CCAFS, 2iE, DGM, and more recently PRISE and the two DFID BRACED supported consortia, led by Christian Aid and Welt Hunger Hilfe (WHH).</p> <p>AMMA-2050 has also been mapping engagement with organisations, networks and research projects working at a regional level, including WECARD/CORAF, ROPPA, ECOWAS, CCAFS, PRISE, BRACED and SREC (see further Output 3).</p>
Percentage / overall satisfaction level of targeted boundary agents and users	Specific support for targeted 'boundary agents' have yet to be initiated. Those participating in stakeholder engagements, KIIs and consultations have expressed their interest in engaging with the project and ensured participation and presentation by high-level representatives within stakeholder meetings.

Partnering scientists have identified a need for strengthening West African scientists' expertise and tools for computing climate change metrics from CMIP data. AMMA-2050 partners have planned a workshop on this for late 2016 with follow-up activity. In terms of strengthening young scientists' research skills, the project will monitor the number of peer-reviewed articles and working papers authored/co-authored by early-career African scientists.

While most interviewed scientists consulted with decision makers about the types of information which can support their decision making, almost a third had no consultation at all with either national or local decision makers. More than half of the interviewed scientists based in Europe had no consultation with national and regional decision makers, and more than two thirds no consultation with local decision makers. Most scientists interviewed considered that channels for dialogue between decision makers and climate information providers are 'partial' or 'somewhat' for national and regional decision makers, and slightly lower for local decision makers. In Burkina Faso, interviewed scientists assessed current channels for dialogue to be higher than was the case with decision makers' responses.

On average, scientists assessed that their organisations had less institutional capacity to communicate with local rather than national and regional decision makers. In regard to updating decision makers of emerging scientific understandings of climate, scientists reported widely varying levels of engagement; averaging partial engagement with national decision makers and some engagement with local decision makers.

In general, scientists felt that their organisations have considerable flexibility to address national and regional decision makers’ climate information needs. In regard to addressing local decision makers’ needs, European rather than Senegalese scientific institutions have greater flexibility. Interviewed scientists in Burkina Faso reported varying levels of flexibility to address both national and local decision makers’ needs.

AMMA-2050 has engaged with the BRACED Christian Aid-led consortium project in Burkina Faso to plan a joint training for how climate information can support local government and livelihood decision making, planned for January 2017. This will combine the expertise of partners from both projects: the rural focus of the BRACED project with the urban focus of AMMA-2050, aiming for concrete follow up and collaborative review.

**OUTPUT 5: Increased understanding of approaches to overcome the social, political, behavioural and economic barriers that prevent climate information from supporting long-term investments, policies and plans**

Indicator(s)	AMMA-2050 Baseline
Number of knowledge products (peer reviewed research papers, briefs, working papers, synthesis papers etc.) outlining the approaches of project partners to understand and overcome contextual barriers to use of climate information in real decision making	0 A summary baseline of the current use of climate information within the decision making processes of focus for the two AMMA-2050 pilots, together with some of the obstacles to use, are outlined in Outputs 2 and 3. More generally, research on use of climate information within decision making across West Africa has found that: farmers are currently adapting to change through observation rather than anticipating risks, decision makers are currently making limited use of information about future climate risks, information that is available is often provided in formats that are not understandable or relevant to specific decision making processes, and approaches to support decision making are often framed by external priorities.

Farmers are aware of long-term trends (decreased rainfall, drought) and inter-annual variations of the climate but there are no terms to express climate in West African languages<sup>49</sup>. In practice farmers are currently adapting to change through observation rather than anticipating risks.<sup>50</sup> Amongst those directly affected by climate, perceptions are often moulded more by the impacts of the climate than the climate itself. Nevertheless there is a good match between the perceptions of farmers and rainfall observations in Senegal where there have been substantial rainfall changes, including increased frequency of intense rainfall, late onset and cessation of rains.<sup>51</sup> Farmers who regularly listen to weather forecasts on the radio are more likely to make an accurate detection of climate changes in conformity with

<sup>49</sup> Attane et al, working draft, p3.  
<sup>50</sup> Kosmowski, working draft, p24.  
<sup>51</sup> Kosmowski, working draft.

observations by climatologists. Many consider the abandonment of traditional rituals as the cause of climatic changes, the decrease in rainfall, the decrease in crop yields and the degradation of pastoral resources.<sup>52</sup> Perception and interpretation of the climate is a cumulative set of knowledge, beliefs and observations that evolves by adapting to new experience. Local knowledge can form a framework of reference within which farmers interpret and adopt scientific information such as weather forecasts<sup>53</sup>, but is currently insufficiently valued (see Output 2).

Research on supporting medium-term decision making highlights the importance of ensuring participatory approaches to planning<sup>54</sup> which recognise different framings, ensuring that efforts focus on supporting a specific, ongoing decision of real concern to local actors, allow for continuous learning and experimentation and engage a range of key actors to ensure that the outputs produce locally-developed solutions which are 'politically supportable and practically implementable'<sup>55</sup>.

#### **4.0 Follow up**

**AMMA-2050 requires a comprehensive policy and stakeholder analysis for the decision making processes of focus for both WP5 and WP6**, including each country's national adaptation programmes for action (NAPA) and draft national framework for climate services, **as well as a need to identify specific opportunities for engaging project findings within key regional decision making processes.**

**AMMA-2050 partners need to develop stakeholder engagement plans for both pilots.** There is considerable interest in the project and effective implementation requires a coherent approach across a wide range of sectors and ministries plus effective coordination with existing coordination platforms and mechanisms.

The policy and stakeholder analyses can ensure a more developed baseline of the current use of climate change information within the decision making processes in the pilot studies in Senegal and Burkina Faso and inform the development of an engagement, uptake and communications strategy for both WP5 and WP6.

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<sup>52</sup> Attane et al, working draft, p19.

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